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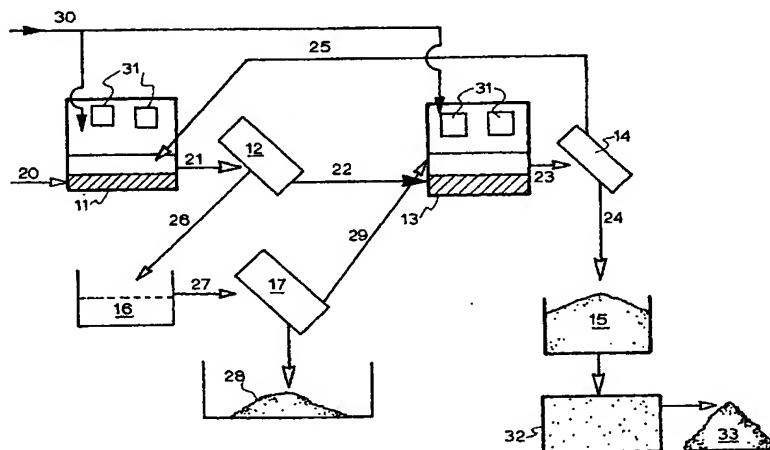
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(54) Title: THE EXTRACTION AND TREATMENT OF HEAVY METALS



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(57) Abstract: Contaminated waste streams or soil or sludge is subjected to a first treatment stage with an acid liquor at a pH below 2 and at a solids content from 5 to 30%; then the liquid and solid phases from the first treatment stage are separated; the solids from the first treatment stage are mixed with a fresh acid liquor at a pH below 2 and a solids content from 5 to 30%; the liquid and solid phases from the second treatment stage are separated; the liquor separated from the first treatment stage is reacted with a base to precipitate the metals; the precipitated metals are separated and the liquor is recycled for reuse in the process; the solids separated from the second treatment stage are neutralized to adjust the pH to a level acceptable for a soil conditioner or fertilizer or other customized products; and the liquor from the second stage is used as the acidic liquor in the first treatment stage. Where the sludge contains hydrogen sulfide the treatment stages are conducted in closed vessels containing a source of ozone in the head space to convert the hydrogen sulfide into a soluble sulfurous or sulfuric acid. The process has the advantage of avoiding any liquid effluent.